

CONTENTS

	Page
1. INTRODUCTION.....	1
2. REVIEW OF LITERATURE.....	3
2.1. Tilapia Classification.....	3
2.2. Tilapia World Production.....	4
2.3. Distribution of Tilapia.....	5
2.4. Tilapia Ecology.....	6
2.4.1. Temperature.....	6
2.4.2. Salinity.....	7
2.4.3. Dissolved oxygen.....	7
2.4.4. Hydrogen ion concentration (pH).....	8
2.4.5. Alkalinity.....	9
2.4.6. Growth performance.....	9
2.4.7. Feeding habits.....	10
2.5. Nutrient Requirements of Tilapia	11
2.5.1. Feed source.....	11
2.5.1.1. Natural feed.....	11
2.5.1.2. Artificial feed.....	12
2.5.1.2.1. Energy requirements.....	13
2.5.1.2.2. Protein requirements.....	17
2.5.1.2.3. Carbohydrate requirements	25
2.5.1.2.4. Lipids requirements.....	27
2.5.1.2.5. Protein: energy ratio.....	31
2.5.1.2.6. Minerals.....	34
2.5.1.2.7. Vitamins.....	37
2.6. Feeding Management of Tilapia	39
2.6.1. Feeding rate.....	39
2.6.2. Feeding frequency.....	42

2.6.3. Stocking density.....	44
2.7. Effect of Initial Size, Dietary Protein and Energy Levels on Growth Performance of Tilapia	47
2.8. Effect of Initial Size, Dietary Protein and Energy Levels on Feed utilization of Tilapia	51
2.9. Effect of Initial Size, Dietary Protein and Energy Levels on Body Composition of Tilapia.....	53
3. MATERIALS AND METHODS.....	55
3.1. Experimental Fish and Management	55
3.2. Experimental Diets.....	56
3.3. Water Quality.....	58
3.4. Measurements Investigated	58
3.4.1. Growth performance parameters.....	58
3.4.1.1. Live body weight and body length	58
3.4.1.2. Weight gain.....	58
3.4.1.3. Specific growth rate	58
3.4.1.4. Condition factor	59
3.4.2. Feed efficiency parameters.....	59
3.4.2.1. Feed conversion ratio.....	59
3.4.2.2. Protein efficiency ratio.....	59
3.4.2.3. Protein productive value.....	59
3.4.2.4. Energy retention.....	59
3.4.3. Hepato and gonado somatic indices.....	60
3.5. Carcass Analysis.....	60
3.6. digestibility Trial	62
3.7. Chemical Analysis.....	63
3.8. Total Fish Production.....	63
3.9. Statistical Analysis.....	63
4. RESULTS AND DISCUSSION.....	64
4.1. First Experiment.....	64

4.1.1. Effect of dietary protein and energy levels on growth performance of Nile tilapia of small initial size (22.87 g).....	64
4.1.1.1. Body weight	64
4.1.1.2. Weight gain	67
4.1.1.3. Body length	69
4.1.1.4. Condition factor	72
4.1.1. 5. Specific growth rate	74
4.1.2. Effect of dietary protein and energy levels on feed utilization of Nile tilapia of small initial size (22.87 g).....	76
4.1.2.1. Means of feed, protein and energy intakes	76
4.1.2.2. Feed conversion ratio	78
4.1.2.3. Protein efficiency ratio	81
4.1.2.4. Protein productive value	84
4.1.2.5. Energy retention.....	86
4.1.3. Effect of dietary protein and energy levels on hepato-somatic and gonado-somatic indices of Nile tilapia of small initial size (22.87 g)	88
4.1.4. Effect of dietary protein and energy levels on carcass traits and chemical composition of Nile tilapia of small initial size (22.87 g)	91
4.1.4.1. Carcass traits.....	91
4.1.4.2. Chemical composition of whole fish	95
4.1.4.3. Chemical composition of fish flesh	98
4.1.5. Effect of dietary protein and energy levels on fish production and profit index of Nile tilapia of small initial size (22.87 g).....	102
4.2. Second Experiment.....	104
4.2.1. Effect of dietary protein and energy levels on growth performance of Nile tilapia of large initial size (39.82 g).....	104
4.2.1.1. Body weight	104
4.2.1.2. Weight gain	107
4.2.1.3. Body length	110

4.2.1.4. Condition factor	112
4.2.1. 5. Specific growth rate	115
4.2.2. Effect of dietary protein and energy levels on feed utilization of Nile tilapia of large initial size (39.82 g).....	117
4.2.2.1. Means of feed, protein and energy intakes	119
4.2.2.2. Feed conversion ratio	122
4.2.2.3. Protein efficiency ratio	125
4.2.2.4. Protein Productive value	127
4.2.2.5. Energy retention.....	129
4.2.3. Effect of dietary protein and energy levels on hepato-somatic and gonado-somatic indices of Nile tilapia of large initial size (39.82 g)	129
4.2.4. Effect of dietary protein and energy levels on carcass traits and chemical composition of Nile tilapia of large initial size (39.82 g)	132
4.2.4.1. Carcass traits.....	132
4.2.4.2. Chemical composition of whole fish	135
4.2.4.3. Chemical composition of fish flesh	139
4.2.5. Effect of dietary protein and energy levels on fish production and profit index of Nile tilapia of large initial size (39.82 g)...	143
4.3. Effect of Initial Size (22.87 and 39.82 g) on Growth Performance and Feed Utilization of Nile Tilapia	146
4.4. Nutrients Digestibility of the Experimental Diets.....	147
5. SUMMARY.....	151
6. REFERENCES.....	163
7. ARABIC SUMMARY	-